STANDARD

PUMPING PLANT FOR WATER CONTROL (No.)

Definition

A pumping facility installed to transfer water for a conservation need, including removing excess surface or groundwater; filling ponds, ditches or wetlands; or pumping from wells, ponds, streams, and other sources.

Purpose

To provide a dependable water source or disposal facility for water management on wetlands or to provide a water supply for such purposes as irrigation, recreation, livestock, or widlife.

Conditions Where Practice Applies

Wherever water must be pumped to accomplish a conservation objective. It is especially applicable for maintaining critical water levels in existing swamps, marshes, or open water and for providing water sources for newly constructed wetlands and ponds.

Planning Considerations for Water Quantity and Quality

QUANTITY

1. Effect of the pumping plant on upstream and downstream quantity.

QUALITY

1. Sediment production caused by erosion during construction.

2. Possible effects on surface and groundwater of spilled fuels and lubricants used to operate and maintain the facility.

Design Criteria

The efficiency of units, type of power, quality of building, automation, and accessories installed shall be in keeping with the value and importance of the system, and shall accomplish the conservation and environmental objectives.

PUMP REQUIREMENTS. The capacities, range of operating lifts, and general class and efficiency of equipment shall be determined from appropriate technical studies. The size and number of pumps and their performance requirements shall be determined on the basis of the conservation requirements of the system. The total head shall be determined for critical operating conditions, taking into account all hydraulic losses. Automatic controls shall be included in the plans as required.

POWER UNITS. The power units shall be selected on the basis of costs, operating conditions, conservation needs, and objectives, including need for automation. The power unit shall be matched to the pump and be capable of operating the pump effectively within the range of operating conditions. The horsepower requirements, pump efficiency, and total head on the pump shall be computed.

SUCTION AND DISCHARGE PIPES. The size of suction and discharge pipes shall be based on studies of efficiencies and effects on costs and operations. The arrangement and length of discharge pipe shall be based on the need for recovery of head through syphonic action, and for delivery of water in keeping with conservation and environmental objectives. Gates, valves, pipe connections, discharge bays, and other protective works shall be installed, as needed, for satisfactory plant operation.

BUILDING AND ACCESSORIES. The design of the plant and associated housing, if required, shall consider the need for protecting equipment from the elements, malicious damage, and fire and the need for equipment maintenance and repairs. The appearance of the plant shall be in keeping with its surrounding environment and its importance or value.

The foundations shall be designed to safely support the loads imposed. Sheet piling or other measures shall be used, as required, to prevent piping beneath the foundation.

Pumps may be mounted in the open, on piling, or in a well or pit.

Suction bays (or sumps) shall be designed to conform to the hydraulic characteristics established by the pump manufacturer.

The discharge bay or connection with distribution system shall be ample to meet hydraulic and structural requirements. Provisions for repair or removal of pumps and engines shall be provided. Trash racks shall be provided, as needed, to exclude debris and trash from the pump.

All structural features and equipment shall provide adequate safety features to protect workers and the public against injury.

Plans and Specifications

Plans and specifications for constructing pumping plants for water control shall be in keeping with this standard and shall describe the requirements for properly installing the practice to achieve its intended purpose.